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Appellants: Claus Erdmann FURST et al.
Application No.: **09/964,893**
Appeal: 2009-004718
Art Unit: 2615
Filed: September 28, 2001
Examiner: Xu Mei
For: MICROPHONE UNIT WITH INTERNAL A/D CONVERTER
Atty. Dkt. No.: 15640-000002/US
Conf. No.: 2614

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May 21, 2010

REQUEST FOR REHEARING UNDER 37 C.F.R. § 41.52

In accordance with the provisions of 37 C.F.R. § 41.52, Appellants respectfully request rehearing of Appeal 2009-004718, decided March 23, 2010 and mailed March 24, 2010, before the Board of Patent Appeals and Interferences (hereinafter "the Board").

BACKGROUND

Reconsideration of the Decision by the Board and reversal of all of the outstanding grounds of rejection to claims 1, 5, 7, 17, 18, 36 and 38 under 35 U.S.C. §103(a) as being unpatentable over Martin, U.S. Patent No.

5,796,848 in view of Arndt et al. (hereinafter "Arndt"), U.S. Patent No. 6,421,448 are respectfully requested. Appellants request a rehearing of Appeal 2009-004718 because the following points have been misapprehended, or overlooked, by the Board.

- I. The Majority, in pages 11-13 of the Decision, overlooks that the high-pass filters of Arndt are not for filtering, or preventing, noise produced by electromagnetic interference.

I. The High-Pass Filters of Arndt Are Not For Filtering, or Preventing Noise Produced By Electromagnetic Interference

Claim 1 is directed to a microphone assembly including (*inter alia*)

filter means in the signal path between the pre-amplifier and the sigma-delta modulator, the filter means preventing low frequency components from reaching the sigma-delta modulator.

In particular, on page 12 of the Decision, the Board concludes that "...a person skilled in the art would have understood that Arndt's disclosed technique of creating an *acoustic* high-pass filter by forming a hole in the microphone diaphragm is an alternative to using an *electrical* high-pass filter in the form of the 'customary circuit.' " The Board further concludes that "...a person skill in the art would have recognized from Arndt that either of these two types of high-pass filters can be used to block or suppress undesirable low-frequency components in a microphone system that has a single microphone, such as Martin's Figure 2 embodiment."

However, Martin is directed to a hearing aid including a microphone. Martin teaches that the microphone 1, the pre-amplifier 8 and the A/D converter 7 of Martin are integrated in the housing 6 having the shielding 9 to shield the microphone 1 against high-frequency electromagnetic emission. Further, signal processing of the digitized signal is done outside of the housing 6 as digital signals are less sensitive to noise and other electromagnetic coupling. In column 1, lines 25-39, Martin acknowledges a problem with electromagnetic emissions being harmful for microphones, and thus offers a solution (namely, the use of the housing 6 having the shielding 9). Appellants submit that one having ordinary skill in the art would not be motivated to include any further means (in addition to, the housing 6 having the shielding 9) to prevent the electromagnetic emissions.

Even assuming *arguendo* that one wanted to prevent the electromagnetic emissions from reaching a microphone, one would not look to Arndt. In particular, Arndt attempts to find a solution for adapting two microphones having different cut-off frequencies (limit frequencies) due to manufacturing tolerances. Two or more microphones are combined in a directional microphone assembly where different transmission behaviors (like different cut-off frequencies) produce a phase error in the two signals delivered by the two microphones that is harmful for further signal processing.

The different cut-off frequencies are due to a small opening that is present in the membrane of each of the microphones to allow venting and pressure equalization. These holes are responsible for a high-pass

characteristic of the membrane, the cut-off frequencies of which are dependent on the dimensions of the holes. The tolerances of these dimensions are unavoidable during manufacturing.

In order to compensate for these tolerances, an additional high-pass filter is placed in the signal path of each of the two microphones. Each of the additional high-pass filters has a cut-off frequency that is selected to match the cut-off frequency produced by the hole in the membrane of the microphone of the respective signal path of the other high-pass filter. Thus, any phase errors are compensated in a cost expedient manner prior to further signal processing. Thus, the high-pass filters are a means for phase compensating, not for reducing or filtering out noise produced by electromagnetic interference (EMI).

In the microphone assembly disclosed in the present application, there is only one membrane present. Hence, there is not need for compensating tolerances and corresponding transmission behavior of different microphones as there is only one microphone.

Further, Arndt mentions the acoustic high-pass characteristic of the membrane itself, but does not mention (aside from the compensating effect) that an electric filter would be necessary in addition to the acoustic high-pass filter. Therefore, neither Martin, nor Arndt, suggest that further filtering of a single microphone's signal is necessary. Appellants submit one skilled in the art would not implement additional features into a device if there is no reason for doing so. In Arndt, the signal processing of directional

microphones including two membranes and two signal paths is for phase compensating, not to further filter out noise.

Despite mentioning that electric high-pass filters are customary circuits in hearing aid, Arndt fails to disclose, or suggest, the use of high-pass filters for filtering out noise, if the acoustic high-pass filter is already present. Therefore, based on the disclosure of Arndt, one having skill in the art would not place an electric high-pass filter into the hearing aid taught by Martin.

As Martin already addresses the problem with EMI, there is no motivation to look elsewhere to address the EMI problem. Even still, assuming *arguendo* that one was motivated to use the acoustic high-pass filter of Arndt, the acoustic high-pass filter would be a simple solution for an additional means. That is, the acoustic high-pass filter of Arndt is not used to, or suggested for, EMI filtering. Thus, the “customary circuit” alone is not enough to motivate one skilled in the art to place a filter between the pre-amplifier 8 and the A/D converter 7.

Furthermore, Appellants submit that the placement of the filter is advantageous. At the selected location, all noise from the environment, or from EMI, which have coupled to the signal path will be filtered out if the filter is placed upstream of the A/D converter 7 and the downstream of the pre-amplifier 8.

For at least these reasons, Appellant submit that Martin in view of Arndt neither discloses, nor suggests, a microphone assembly including “filter means in the signal path between the pre-amplifier and the sigma-

delta modulator, the filter means preventing low frequency components from reaching the sigma-delta modulator” as recited in independent claim 1. Accordingly, Appellants respectfully submit that the rejection under § 103(a) should be reversed.

CONCLUSION

In light of the above arguments, the Board is respectfully requested to rehear Appellants’ arguments on appeal and overturn the rejection to claims 1, 5, 7, 17, 18, 36 and 38 in connection with this application.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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